

ON THE TRICHOPTERA OF NEPAL



BY

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British Museum (Natural History)

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ON THE TRICHOPTERA OF NEPAL

By D. E. KIMMINS

SYNOPSIS

A study of the collections made by the two British Museum (Natural History) Expeditions to Nepal, 1954 and 1961-62, has resulted in a list of twenty-eight species, of which one genus and fourteen species are here described as new.

BOTH expeditions included an entomologist, Mr. J. Quinlan in 1954 and Mr. R. L. Coe in 1961-62, but in neither case were Trichoptera the sole object of their attentions. The present list can therefore be regarded only as a beginning, and specialised collecting, over a wider area, will undoubtedly result in a very much greater list. As far as I know, no previous list of Nepalese Trichoptera has been published. In addition to those included in the present list, two other species have already been described in manuscript by Dr. F. Schmid. The types of new species described in this paper are in the British Museum (Natural History). To save space, collector's initials only are given in the list, (RLC) = R. L. Coe and (JQ) = J. Quinlan.

Family RHYACOPHILIDAE

Rhyacophila sp. n. A

This species is being described by Schmid.

Taplejung Distr., Sangu, c. 6,200 ft., xi.1961-i.1962, 1 ♂ (RLC).

A female from Ulleri, 6-7,000 ft., 19.v.1954 (JQ), probably belongs here.

Rhyacophila sp. n. B

This species is also being described by Schmid.

Bahkri Kharka, 5,500 ft., 23.iv.1954, 1 ♂ (JQ).

Himalopsyche phedongensis Kimmins

Taplejung Distr., Dobhan, c. 3,500 ft., no date, 1 ♂ (RLC).

Previously recorded from SIKKIM.

Himalopsyche digitata (Martynov)

Bahkri Kharka, 5,500 ft., 23.iv.1954, 1 ♂ (JQ).

Previously recorded from E. HIMALAYAS, Darjeeling district.

Family GLOSSOSOMATIDAE

Agapetus triangularis Martynov

Arun Valley, below Tumlingtar, R. Sabhaya, c. 1,800 ft., 22.xii.1961, 1 ♂, 1 ♀, (RLC).

Previously recorded from HIMALAYAS.

Synagapetus tamrangensis sp. n.

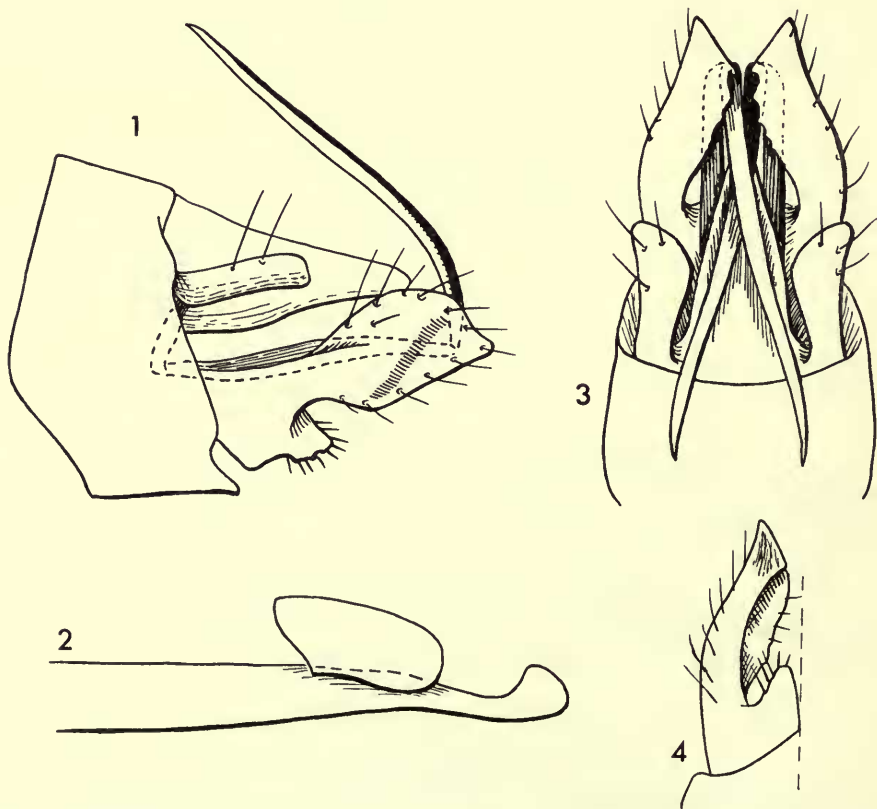
(Text-figs. 1-4)

♂. Blackish, with sparse fuscous pubescence on wings. In hind wing, R_1 terminates in Sc and is connected to R_{2+3} by a cross-vein. Base of fork R_4 beyond that of fork M_1 .

♂ GENITALIA. A short, blunt process to the sixth sternite. Ninth segment with apical ventral margin triangularly produced below the base of the claspers, appearing as a ventral process in side view. Tenth tergite about as long as claspers, forming a triangular hood in dorsal and lateral view, the lateral margins more sclerotized than the centre. Cercus a little more than half as long as tergite, digitate in side view, inner margin convex in dorsal view, apex a little out-turned. Arising from each lower basal angle of the tenth tergite is a long, two-segmented spine, the apical section folded forward over the tergite and, in the type, the two spines crossing each other. Aedeagus slender, with a clavate apex in side view. Above it is a small, saddle-shaped sclerite (? tenth sternite). Clasper of the pattern of *S. incurvatus*, the apical half more dilated in side view, upper margin more incurved, apex angular rather than rounded and with an oblique row of stout, comb-like teeth on the inner surface. The ventral branch more pronounced than in *incurvatus*.

♀ Unknown.

Length of fore wing, 4 mm.



FIGS. 1-4. *Synagapetus tamrangensis* sp. n. ♂ Genitalia. 1, lateral; 2, aedeagus and ? tenth sternite, lateral; 3, dorsal; 4, left clasper, ventral.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., i.1962 (RLC), BMNH.

This species is closely related to *S. incurvatus* Kimmins (Burma), differing in the longer cercus, which is more strongly convex on its inner surface, and in the details of the clasper, especially in the presence of a row of comb-like teeth on the inner surface.

A single female *Synagapetus* from Sangu may belong to this species, but as it comes from a different locality, it is left undetermined.

***Nepaloptila coei* gen. n., sp. n.**
(Text-figs. 5-8)

♂. The holotype was not in good condition and has been mounted as a microscope preparation. The general colour was dark grey, with greyish pubescence on the wings. Spurs 0.4.4. Pronotum with the dorsal surface densely covered with erect, blackish, scale-like hairs. Two rounded warts present on mesoprescutum, two on mesoscutum (one on each side of scutellum), the latter without warts. Wings rather narrow, venation lightly sclerotized, cross-veins somewhat obscure. In fore wing, all five apical forks present, forks R_2 and R_4 very long and narrow, R_2 with a short footstalk, R_4 sessile. These two forks extend basally to the middle of the wing. The discoidal cell extends from the middle of the wing to within one fourth from the base. The media forks at about the middle of the wing, forks M_1 and M_3 stalked. Veins Cu_1 and Cu_2 run separately into the wing margin, fork Cu_{1a} sessile. Vein Cu_2 with a row of stout setae about midway on the under surface. Hind wing with R_1 terminating in Sc , a faint cross-vein between it and R_{2+3} . Apical forks R_4 and M_1 stalked, Cu_{1a} sessile.

♂ GENITALIA. Process of the sixth sternite slender, slightly clavate apically in side view. Ninth segment with the centre of its dorsal apical margin produced in a strong, triangular tooth, curving slightly downwards. Tenth segment fused to ninth, appearing as a pair of short, downwardly directed processes, one arising from each upper lateral margin of the ninth segment. Aedeagus long, stout basally, its apex tapering to an acute point and with its dorsal surface before the apex bearing some inflated membrane, within which are two curved, sclerotized rods and some spines. Claspers fused to ninth segment, broad at base in side view, extending in a digitate process, whose apex is slightly dilated in ventral view, the inner apical angle toothed. Between the claspers, the margin of the ninth sternite is produced in a broad triangle, whose apex is bilobed slightly, each lobe terminating in a seta.

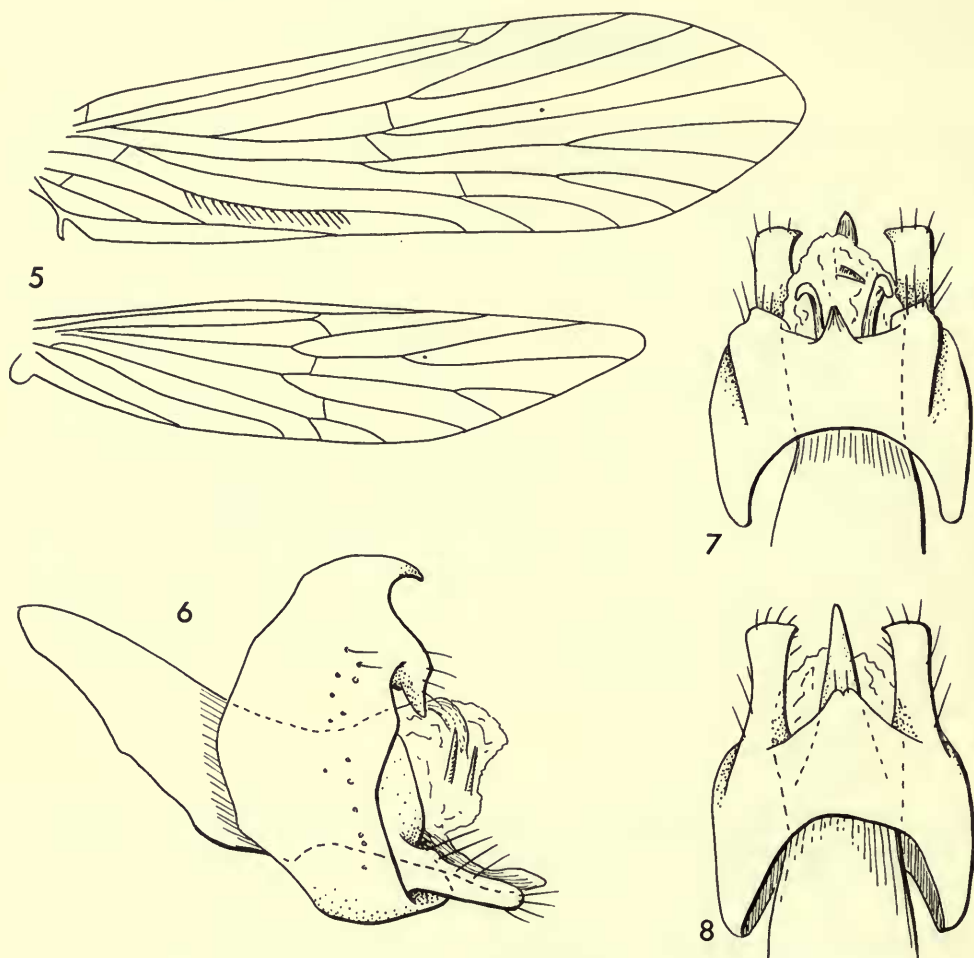
♀ Unknown.

Length of fore wing, ♂, 2.5 mm.

Holotype ♂ (mounted as microscope preparation), Arun Valley, below Tumlingtar, R. Sabhaya, west shore, c. 1,800 ft., on dead leaves lying in sun on sandy shore, 22.xii.1961 (RLC), BMNH.

The holotype has very much the appearance of a small *Agapetus*, but it has been placed in the Protoptilinae on the absence of mesoscutellar warts, the presence of rounded warts on the mesoscutum and the presence of stout setae on Cu_2 in the fore wing. The venation recalls that of the Agapetinae, but in this subfamily stout

setae on or near Cu_2 in the fore wing are unknown and there are always warts on the mesoscutellum. Apical fork Cu_{1a} is usually lacking in the Protoptilinae, where Cu_1 and Cu_2 often fuse apically in the fore wing, although they are separate in *Matrioptila*. The general plan of the venation is otherwise like that of *Matrioptila* and the male genitalia also show some resemblance. In its retention of fork Cu_{1a} in the fore wing, *Nepaloptila* would appear to be more primitive than *Matrioptila*, and this makes its discovery in Asia a matter of some interest, since all previous records of Protoptilinae are from the New World. The presence of warts on the mesoscutellum has been listed by Ross (1956) as one of the characters of a primitive caddisfly ; these warts occur in the Agapetinae and are lacking in the Protoptilinae.

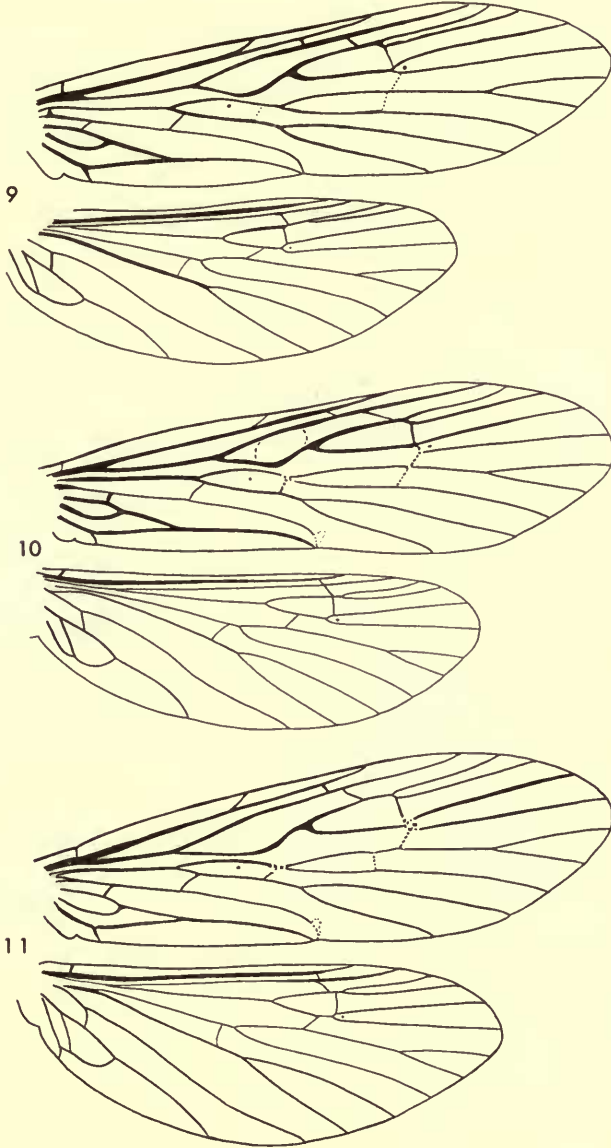


FIGS. 5-8. *Nepaloptila coei* gen. sp. n. ♂. 5, wings ; 6, genitalia, lateral ; 7, dorsal ; 8, ventral.

Family **PHILOPOTAMIDAE***Chimarra nepalensis* sp. n.

(Text-figs. 9, 12-17)

♂. Head and thorax piceous above, with black and greyish hairs, thorax beneath and legs fuscous. Antennae and palpi piceous. Abdominal segments bright yellow, genital capsule



FIGS. 9-11. *Chimarra* spp. n. Wings. 9, *C. nepalensis* ; 10, *C. fenestrata* ; 11, *C. nigra*.

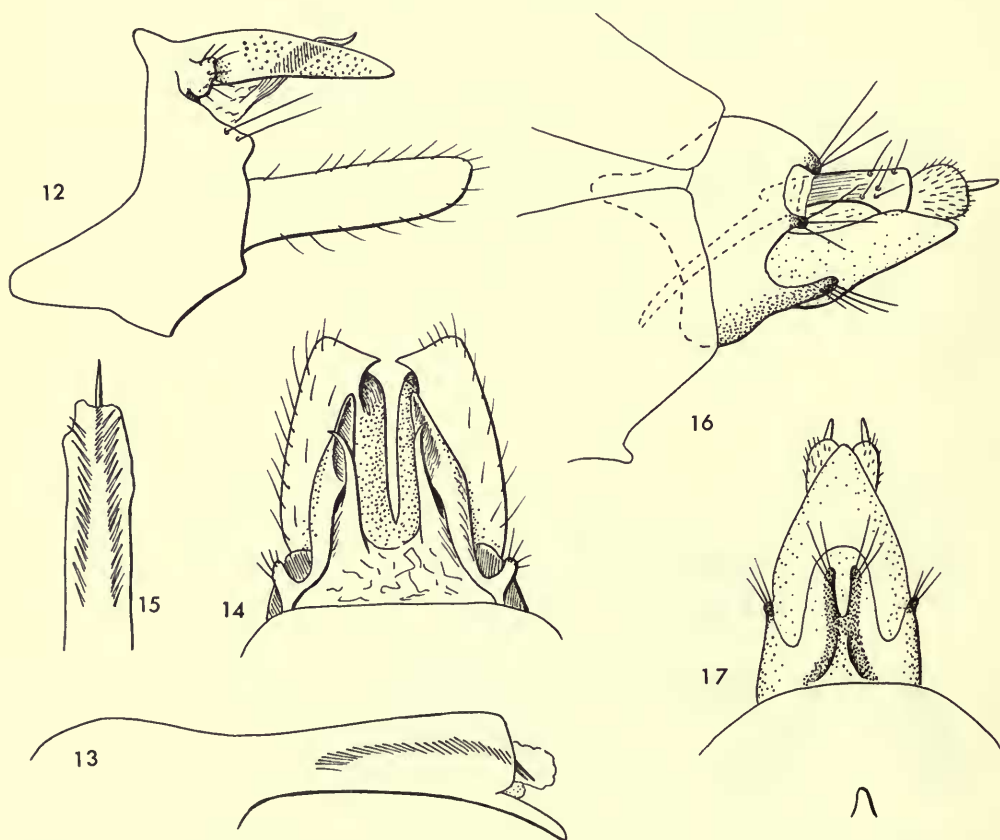
piceous. Wings dark fuscous to piceous, with fuscous pubescence. In fore wing, the discoidal cell is about as long as median cell, rather broader, tapering slightly to a blunt base. R_s strongly bent towards M . Apical fork R_2 very narrow. In hind wing, apical fork R_2 is also narrow and with a short footstalk.

♂ GENITALIA. Very similar to *C. khasia* Kimmins, the lobes of the tenth segment and the claspers almost indistinguishable. The inner branch of the tenth segment differs somewhat, being more slender, not blade-like and its apex not bifid. The lower apical margin of the aedeagus is produced in a slender spine and within the basal sleeve are two parallel rows of stout spines, directed outwardly in dorsal aspect.

♀ GENITALIA. A small process situated near the centre of the seventh sternite. Eighth segment synscleritous, with three pairs of hair-tufts, two dorsal, two lateral and two ventral. The segment around their bases more heavily pigmented, the pigmentation around the ventral ones more extensive, reaching almost to the base of the segment. Between the ventral tufts, a hyaline area gives the impression of a narrow excision. The apical margin of the eighth sternite is extended in a boat-shaped subgenital plate, its apex exceeding the apex of the ninth segment.

Length of fore wing, ♂, 6.5 mm., ♀, 7 mm.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., Sangu,



FIGS. 12-17. *Chimarra nepalensis* sp. n. Genitalia. 12, ♂, lateral; 13, ♂, aedeagus, lateral; 14, ♂, dorsal; 15, ♂, aedeagus, dorsal; 16, ♀, lateral; 17, ♀, ventral.

c. 6,200 ft., mixed vegetation by stream in gully, xi.1961-i.1962 (RLC), BMNH.

Allotype ♀ (pinned, abdomen cleared and in glycerine), data as holotype ♂ (RLC), BMNH.

Paratypes (pinned), same data as holotype, 4 ♂, 5 ♀; 16-29.x.1961, 1 ♂; Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961, 1 ♀; between Sangu and Tamrang, deep river gorge, c. 5,200 ft., i.i.1962, 2 ♂ (RLC), BMNH.

This species differs from *C. khasia* Kimmins in the more quadrangular discoidal cell and more strongly arched *Rs* in fore wing and in the simple, spiniform branch to the tenth segment, the aedeagus with two parallel rows of spines and a spiniform production of its apex and the more acutely pointed inner apical angles of the claspers in dorsal view. The female of *C. khasia* is not known.

Chimarra fenestrata sp. n.

(Text-figs. 10, 18-19)

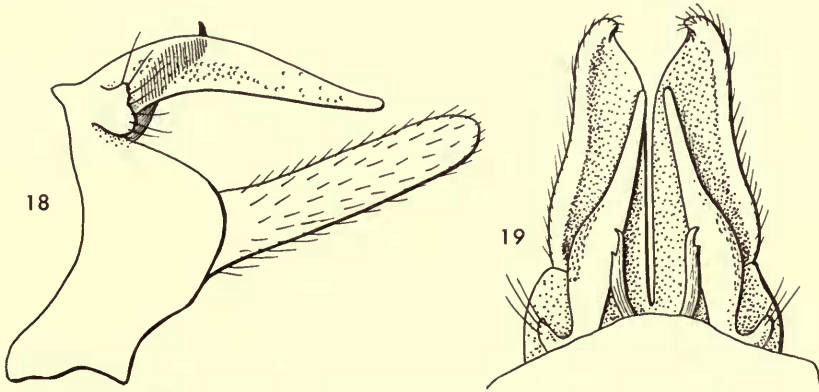
♂. General coloration much as in *C. nepalensis* sp. n., but with a definite hyaline window in the radial area of the fore wing, between the origin of *Rs* and the base of the discoidal cell, and a less defined hyaline patch in the radial area of the hind wing. Venation much as in *C. nepalensis* but apical fork *R*₂ is broader in both wings. Apex of fore wing less acute. Abdomen yellow, tergites with a fuscous tinge in some examples.

♂ GENITALIA. Of the same general pattern as *C. khasia* and *C. nepalensis*. In side view, the lateral margins of the ninth segment are evenly rounded, not angled as in *nepalensis*. The lobes of the tenth segment are longer, narrower and more downwardly arched, converging somewhat apically. The inner branch of the tenth tergite is stouter, its apex angled abruptly upwards and with a small, subapical tooth in dorsal aspect. Aedeagus much as in *C. nepalensis*. Clasper longer and narrower in lateral aspect, its apex in dorsal view tapering to a small hook, not truncate as in *nepalensis*.

♀. Two females provisionally associated with the males agree in the hyaline pattern of the wings but the female genitalia show no appreciable difference from *nepalensis*.

Length of fore wing, ♂, 5 mm., ♀, 7 mm.

Holotype ♂ (pinned, one pair of wings mounted dry, abdomen in glycerine), Taplejung Distr., Sangu, c. 6,200 ft., mixed vegetation by stream in gully, xi.1961-i.1962 (RLC), BMNH.



FIGS. 18-19. *Chimarra fenestrata* sp. n. ♂ Genitalia. 18, lateral; 19, dorsal.

Paratypes (pinned), same data as holotype, 1 ♂; Dobhan, east bank of R. Tamur, c. 3,500 ft., mixed vegetation by stream in deep gully, i-ii.1962, 1 ♂ (RLC), BMNH.

The two females provisionally associated with the holotype have the same data as that specimen.

This species is very closely allied to *C. nepalensis* and had there been only a single example, one might easily have considered it to be a variety. There are however eight males of *nepalensis* and three of *fenestrata* and there does not appear to be any intergrading between them, even in the same locality. There is no indication whether there was any difference in the emergence time of the two species in this locality. The differences in structure are listed in the above comparative description.

Chimarra nigra sp. n.

(Text-figs. 11, 20-23)

General colour black or very dark grey, abdomen pale fuscous or dull orange. Wings with sparse blackish pubescence. In the fore wing, *Rs* arises at the level of the fork of *M* and *Cu*₁, running close to the thyridial cell, then curving sinuously to the base of the discoidal cell. The latter is clearly beyond the base of the median cell. Hind wing much as in *C. nepalensis*.

♂ GENITALIA. Ninth segment with lateral margins rather abruptly angled in side view above the claspers. Sternite with a prominent ventral process. Tenth segment divided into two lateral lobes, each with an inner, digitate branch about two-thirds as long as lobes, straight in dorsal view, slightly arched near base in side view. Lobes in side view stout, somewhat quadrate, upper margin convex, lower apical angle produced. External surface convex, with numerous minute setae arising from small, raised bases. From above the lobes are broad basally, tapering towards apices, which are angled inwards. At the base of the lobe arises a small setiferous wart, fused to the margin of the ninth segment, possibly a reduced cercus. Aedeagus with a simple basal sleeve, within which is membrane and a few, very slender, curved spines. Claspers stout, extending beyond apices of tenth segment, more or less parallel-sided in lateral view. From beneath, the inner margin is sinuous, inner apical angle produced inwards in an acute tooth.

♀ Unknown.

Length of fore wing, 5.5 mm.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961 (RLC), BMNH.

Paratypes ♂ (1 pinned, 1 in glycerine), same data.

In male genital structure, this species resembles *C. fusca* Kimmins (Assam), but differs in details. The tenth segment is shorter and stouter and the inner branch is straighter. The lateral margin of the ninth segment is angularly produced and stouter in lateral view, its inner apical angle is more strongly produced and the inner ventral margin more strongly sinuous.

Chimarra biungulata sp. n.

(Text-figs. 24-26)

Head and antennae dark fuscous, the latter obscurely annulated with paler fuscous. Palpi fuscous. Thorax and legs fuscous. Wings pale fuscous, much denuded, venation darker, except the cross-veins closing the discoidal and median cells, the radio-medial cross-vein, the stem of *M* basad of median cell and the arculus, which are whitish in the fore wing. *Rs* in fore

wing scarcely sinuate. Fork Cu_{1a} short, extending only a little basad of cross-vein closing median cell. Thyridial cell long and narrow.

♂ GENITALIA. Apical margin of eighth tergite spinose, sternite with a process at centre of apical margin. There is also a ventral process in the centre of the ninth sternite. Tenth tergite forming a pair of lateral plates, one on each side of the aedeagus, lateral margins in the apical half produced outwards in two teeth, the apical ones the smaller. Cercus short, digitate. Aedeagus cylindrical, with a pair of slender, spine-like parameres and with a pair of stout claws extruded from the membrane at the apex. Claspers caliper-like in ventral view, strongly widened in basal half, inner margin serrate, with a rounded upper lobe. Apex of clasper densely spinose on outer surface.

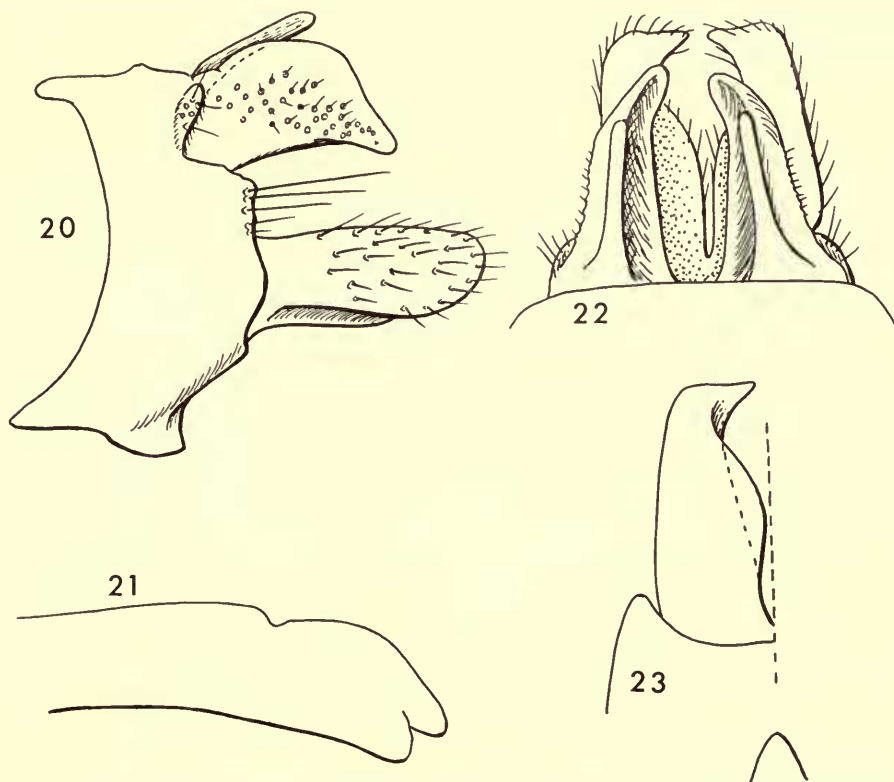
♀ Unknown.

Length of fore wing, 4.3 mm.

Holotype ♂ (pinned, with abdomen in glycerine), Taplejung Distr., river bank below Tamrang Bridge, c. 5,500 ft., x-xi.1961 (RLC), BMNH.

Paratype (pinned), Taplejung Distr., Sangu, c. 6,200 ft., 22.xi.1961, mixed plants by deep cliff in river gorge, 1 ♂ (RLC), BMNH.

This species appears to be related to *C. sepulcralis* Hagen (Ceylon). The tenth tergite has the two pairs of lateral teeth closer together in the apical half. The



FIGS. 20-23. *Chimarra nigra* sp. n. ♂ Genitalia. 20, lateral; 21, aedeagus, lateral; 22, dorsal; 23, left clasper, ventral.

aedeagus has the two parameres or spines, but these are more nearly equal in length and the apical hooks are larger. The claspers are more strongly incurved in ventral view, more strongly dilated in basal half and with the apex more strongly setose.

***Chimarra suryasena* Schmid**

Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961, 2 ♂, 1 ♀ (RLC).

Previous distribution, PAKISTAN, N.W.F.P., Balakot.

***Chimarra* spp. indet.**

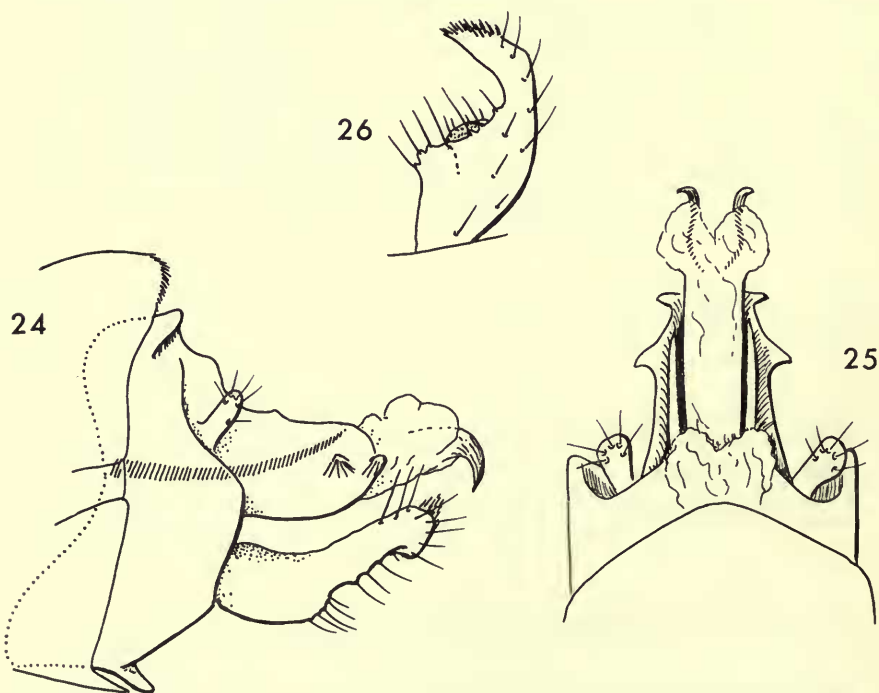
Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961, 1 ♀ (RLC).

Arun Valley, below Tumlingtar, R. Sabhaya, west shore, c. 1,800 ft., 9-17.xii.1961, 1 ♀ (RLC).

***Dolophilodes rossi* Kimmins**

Bakhri Kharka, 5,500 ft., 23.iv.1954, 1 ♂ (JQ).

Previous distribution, N.E. Burma (Kambaiti).



FIGS. 24-26. *Chimarra biungulata* sp. n. ♂ Genitalia. 24, lateral; 25, dorsal; 26, right clasper, ventral.

Family **POLYCENTROPODIDAE***Dipseudopsis* sp.

Phewa Tal, near Pokhara, 2,500 ft., 10.iv.1954, 2 ♀ (*JQ*).

Family **STENOPSYCHIDAE***Stenopsyche griseipennis* McLachlan

Arun Valley, below Tumlingtar, R. Sabhaya, west shore, c. 1,800 ft., 1 ♂, 1 ♀ (*RLC*); Tumlingtar, bare rocky slopes above R. Sabhaya, west bank, c. 1,900 ft., 8-24.xii.1961, 1 ♂ (*RLC*).

Distribution. INDIA (Masuri, Simla); SIKKIM (Phedong); N. BURMA (Mishmi Hills).

Family **HYDROPSYCHIDAE***Macronema fastosum* Walker

Taplejung Distr., Sangu, c. 6,200 ft., mixed vegetation by stream in gully, ix-x.1961, 1 ♀ (*RLC*).

A very variable species, ranging over INDIA, MALAYA, CHINA, FORMOSA, and BORNEO.

Diplectrona sanguana sp. n.

(Text-figs. 27-29)

♂. Head fuscous, with dark fuscous hairs and sparse golden pubescence. Antenna with two basal segments fuscous, remaining segments pale fuscous with fulvous articulations. Palpi fuscous. Thorax dark fuscous. Legs pale fuscous, median and posterior tibiae rather darker. Wings with smoky brown membrane, the fore wing covered with fuscous and golden pubescence, the latter forming numerous small speckles. Hind wing with sparse fuscous pubescence. The venation of the fore wing agrees with Martynov's description of *D. marginata* (Betten), but in the hind wing fork R_2 is twice as long as its footstalk and fork Cu_{1a} is relatively shorter and broader.

♂ GENITALIA. A pair of internal bodies opening on the intersegmental membrane between the seventh and eighth segments. Ninth segment with its lateral margin produced in a triangular lobe in the lower half, forming a groove into which fits the basal segment of the clasper. Tenth segment fused to ninth, forming a pair of spreading, rounded lobes in dorsal view, and each bearing on its dorsal surface a raised, rounded wart, covered with setae. Between the lobes are a pair of downwardly directed, digitate processes. Aedeagus dilated apically, bearing two pairs of tapering processes and, within its apex, a small transverse plate. Terminal segment of clasper slender, incurved and acute at its apex.

♀ Unknown.

Length of fore wing, 7 mm.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., Sangu, c. 6,200 ft., by rocky stream, 7-16.x.1961 (*RLC*), BMNH.

Paratypes (pinned), same data, 9 ♂, BMNH.

This species is related to *Diplectrona marginata* (Betten) Martynov, 1935 and to *D. burha* Schmid, but differs from them in the rounded lobes of the tenth tergite and in the more hooked and acute terminal segment of the clasper, and from *D. burha* also in the narrow median processes of the tenth segment.

Family **HYDROPTILIDAE***Madioxyethira nepalensis* sp. n.

(Text-figs. 30-34)

♂. General colour blackish, tips of antennae pale. Spurs apparently 0.2.4, but microscopic examination reveals a minute, rounded apical spur on the anterior tibia. Wings densely hairy, entirely blackish; venation obscure but apparently much as in *M. milinda* Schmid.

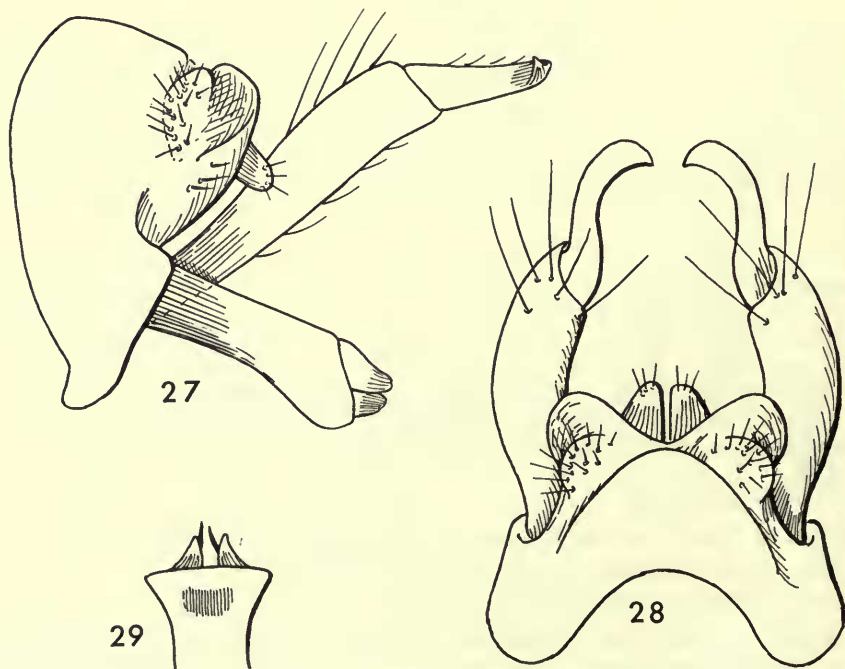
♂ GENITALIA. Following the general pattern of *M. milinda* but differing in the following points. Basal apodeme of ninth tergite longer, about two and a half times as long as tergite and extending to base of the seventh segment. Lower apical angle of ninth tergite produced obliquely downwards and basally as a narrow, pigmented rod, finely denticulated on its ventral surface. Tenth segment lightly sclerotized. Claspers in side view tapering to a rounded apex, ventral margin less convex than in *milinda*, and lacking the dorsal tooth. From beneath, the apical part of the claspers are less divergent and the basally produced part is less dilated. The aedeagus is more complex apically, being divided into two narrow, foliate lobes and two narrow divergent spines. In the holotype preparation, the aedeagus has rotated on its longitudinal axis through 90°.

♀ Unknown.

Length of fore wing, ♂, 2 mm.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., Sangu, c. 6,200 ft., mixed vegetation by stream in gully, xi.1961-i.1962 (RLC), BMNH.

The characters separating this species from *M. milinda* are set out in the above description. I differ from Schmid in my interpretation of the structure which he



FIGS. 27-29. *Dipletrona sanguana* sp. n. ♂ Genitalia. 27, lateral; 28, dorsal; 29, apex of aedeagus, ventral.

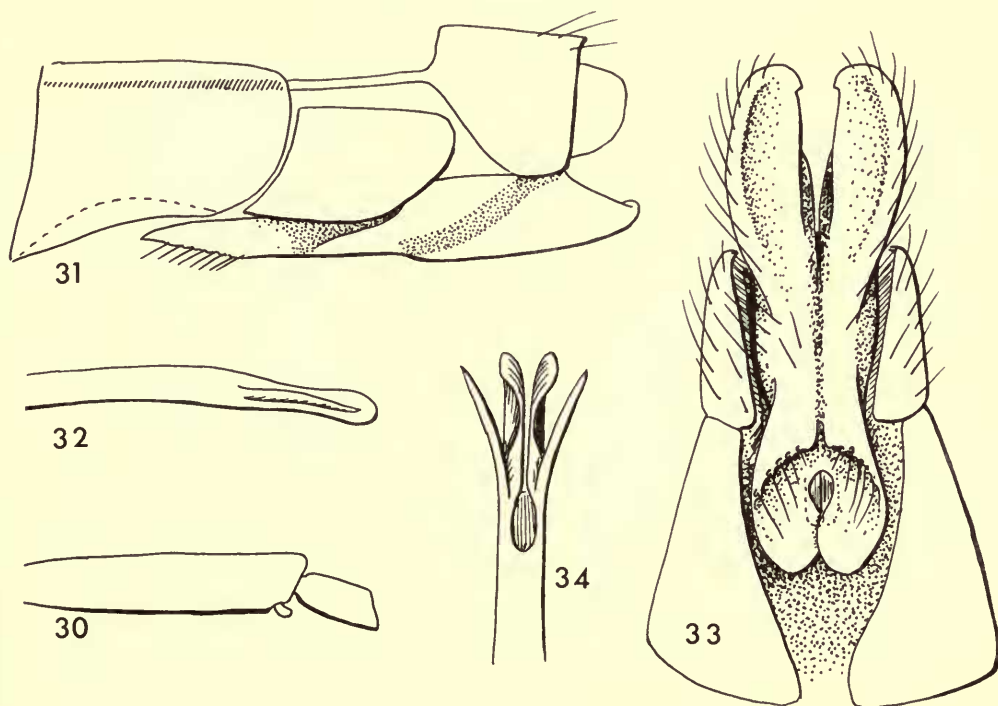
terms "bourrelet bombé". He describes it as a prolongation of the tenth tergite, whereas in *nepalensis* this structure is more slender and appears to be a prolongation of the lower apical angle of the ninth tergite. The very curious structure described as "claspers" may possibly arise from a fusion of the eighth and ninth sternites and claspers. It certainly appears to be attached to the eighth and ninth segments. The discovery of a second species of *Madioxyethira* confirms Schmid's belief that it is a distinct genus.

***Stactobia schmidi* sp. n.**

(Text-figs. 35-37)

The unique male was in poor condition and much denuded and has been made into a microscope preparation. All that one can say of its general appearance is that it was blackish and that the spur formula is 1.2.4.

♂ GENITALIA. A long ventral process to the seventh sternite. Eighth sternite with a median, V-shaped membranous area at its apical margin, fringed with long setae. Ninth tergite nearly three times as long as deep, the centre of its apical margin triangularly produced and the lateral margins of the tergite still further produced as triangular side-pieces, each bearing two stout, socketted spines, the upper the larger. Ventral surface of ninth tergite membranous, at its base two small, narrow claspers, about one fourth as long as tergite, each with a triangular projection on inner margin near apex. Tenth segment forming a pair of narrow lobes, directed



FIGS. 30-34. *Madioxyethira nepalensis* sp. n. ♂. 30, apex of anterior tibia ; 31, genitalia, lateral ; 32, aedeagus, lateral ; 33, genitalia, ventral ; 34, aedeagus, ventral.

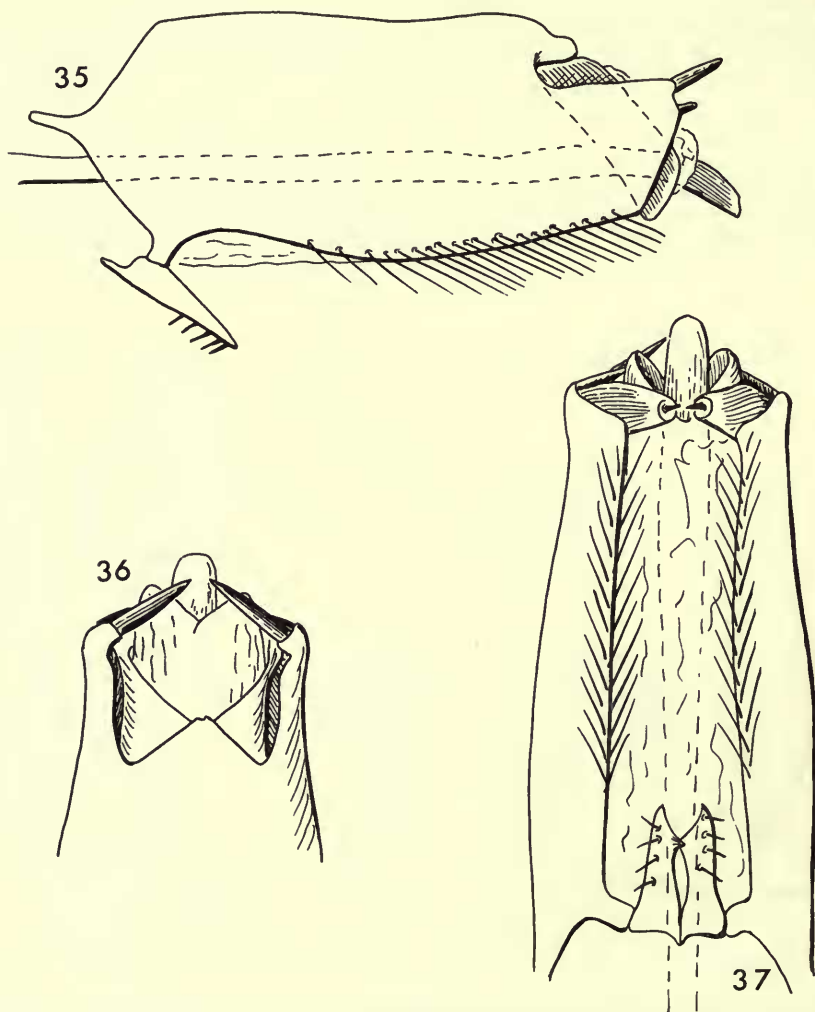
obliquely downwards and partly encircling the aedeagus, the apex of each lobe with a short, black spine, set in a cup-like base. Aedeagus slender, as long as sixth to ninth segments, apparently without parameres.

♀ Unknown.

Length of fore wing. 3.2 mm.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., Dobhan, c. 3,500 ft., shady places on shrubby slope above R. Tamur, 21-27.i.1962 (RLC), BMNH.

This species differs from all those figured by Schmid in his revision of *Stactobia* in the very long ninth tergite. The elongation occurs beyond the attachment of



FIGS. 35-37. *Stactobia schmidi* sp. n. ♂ genitalia. 35, lateral; 36, dorsal; 37, ventral.

the claspers and, as the distance between this point and the origin of the basal apodeme is short, the claspers are almost at the base of the ninth segment.

Hydroptilidae ♀♀, sp. indet.

Taplejung Distr., Dobhan, c. 3,500 ft., shady places on shrubby slope above R. Tamur, 21-27.i.1962, 1 ♂; spray-splashed rocks in R. Maewe, 25.i.1962, 3 ♀ (RLC).

Arun Valley, below Tumlingtar, R. Sabhaya, west shore, c. 1,800 ft., 22.xii.1961, 1 ♀ (RLC).

Family PHRYGANEIDAE

Eubasilissa maclachlani (White)

Siklis, 7,000 ft., 22.iv.1954, 1 ♀ (JQ).

Distribution. HIMALAYAS.

Family LIMNephilidae

Pseudostenophylax himalayanus Martynov

Bakhri Kharka, 5,500 ft., 23.iv.1954, 1 ♂ (JQ).

Previous distribution. TIBET, SIKKIM.

Family ODONTOCERIDAE

Psilotreta quinlani sp. n.

(Text-figs. 38-43)

Head fuscous, with castaneous hairs. Antennae fuscous, with coppery pubescence basally, gradually shading into cream (apex missing). Palpi fuscous, with fuscous and greyish pubescence. Thorax fuscous, with castaneous hairs. Legs fuscous, with dense coppery pubescence, the membrane in the anterior portion of the fore wing with faint hyaline speckles and the apical part of the costal and subcostal areas hyaline. Venation normal for the genus. Apical fork R_2 overlapping the apical half of the disocidal cell in both wings of both sexes. In the male fore wing, the stems of M_1 and vein Cu_2 are more or less obsolete, M_{3+4} fused with Cu_{1a} . In the female fore wing, the stem of M is weak, fork M_1 is present and M_{3+4} separate from Cu_{1a} . Cu_2 is weak and fuses with $1A$ apically. The male wings are shorter and more rounded apically than in the female.

♂ GENITALIA. Ninth sternite with obtuse side-pieces. Tenth segment fused to ninth, the median portion triangularly produced, terminating in a cordate lobe. Lateral lobes fused to median, apex terminating in a spirally-coiled process, and with a thin, bifid plate arising at the base of the process, directed basally and upwards. Cerci nearly as long as the tenth tergite, narrowly foliate. Aedeagus stout, membranous apically, enclosing two or three curved spines. Claspers two-segmented, basal segment stout, about as long as tenth tergite, from beneath slightly sinuous, second segment barely one-fourth as long as basal, narrow, apex denticulate.

♀ GENITALIA. Ninth and tenth tergites fused to make a large hood, triangular from the side, with the apex obliquely truncate. From beneath, the lateral margins are incurved to form two rounded lobes. There is a parabolic subgenital plate, attached by its basal angles to the lower corners of the ninth tergite and only membranously linked to the eighth sternite. The subgenital plate is unpigmented along its median line.

Length of fore wing, ♂, 9.5 mm., ♀, 13 mm.

Holotype ♂ (mounted as microscope preparations), Ulleri, 6-7,000 ft., 19.v.1954 (JQ), BMNH.

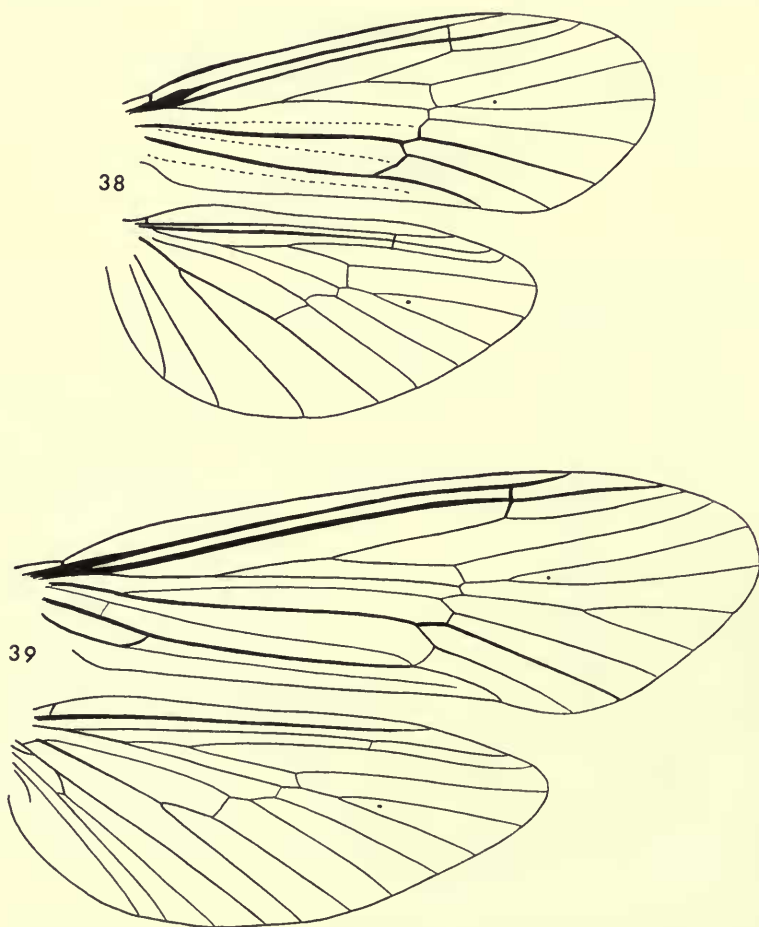
Allotype ♀ (pinned, one pair of wings and abdomen mounted as microscope preparations), same data, BMNH.

Paratype ♀ (pinned), same data, BMNH.

In the structure of the tenth segment, this species somewhat resembles *Psilotreta orientalis* Chi-ling. The apices of the lateral lobes bear similar curled spines but of a different shape. The cerci are stouter and the claspers are more sinuous in side view and the terminal segment is not bifid. The wing venation of *orientalis* (if correctly drawn) is quite different, as the discoidal cell on both wings appears to be open or lacking.

Marilia sp.

Taplejung Distr., Sangu, c. 6,200 ft., mixed vegetation by stream in gully, ix-x.1961, 2 ♀ (RLC).



FIGS. 38-39. *Psilotreta quinlani* sp. n. Wings. 38, ♂; 39, ♀.

In the absence of males, these two specimens are left with a generic determination only. Several species have been described from China, based upon males only, and since there is a sexual dimorphism in the venation, it is preferable to wait until males are available.

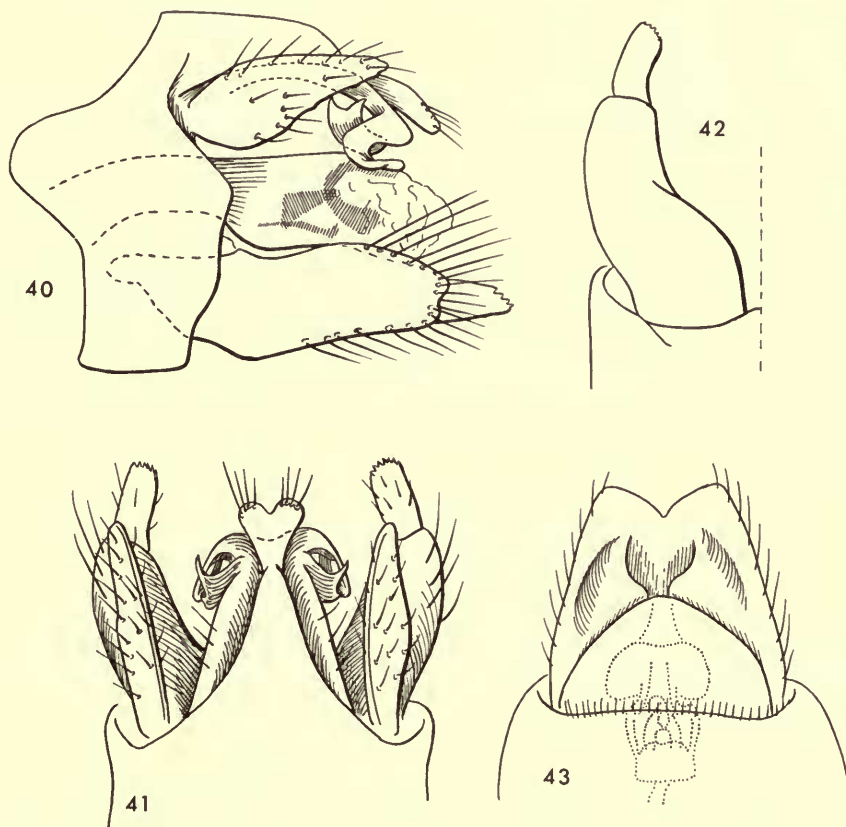
Family **LEPTOCERIDAE**

Adicella trifida Kimmins

Adicella trifida, Kimmins, 1963, *Bull. Brit. Mus. (Nat. Hist.)*, *Ent.* **14** (6) : 10, figs. 24-29

Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., ix-x.1961, 1 ♂ (*RLC*).

The type and allotype of this species were taken in N.E. BURMA (Kambaiti). This specimen is a little smaller and differs slightly in genitalia, but the differences do not amount to more than individual variation.



FIGS. 40-43. *Psilotreta quinlani* sp. n. 40, ♂ genitalia, lateral ; 41, ♂ dorsal ; 42, ♂ left clasper, ventral ; 43, ♀ genitalia, ventral.

Family **UENOIDAE (=THREMMIDAE)*****Uenoa hiberna* sp. n.**

(Text-figs. 44-47)

♂. Head fuscous, with golden pubescence ; only two ocelli. Antennae fuscous, with golden pubescence. Maxillary palp single-segmented, slender, reaching almost to the base of the antenna. Thorax fuscous, with golden and fuscous hairs. Legs tawny, with golden and fuscous pubescence, spurs fuscous. Wings smoky hyaline, with darker venation, bearing long, semi-erect setae. In the fore wing, the discoidal cell is relatively longer and narrower than in *U. burmana* (Mosely). The hind wing is more acute at the apex.

♂ GENITALIA rather like that of *U. burmana*. The inner lobes of the tenth segment are shallowly excised at their apices, the inner apical angles in side view giving the appearance of a small, downturned hook. The outer lobes (? cerci) are more quadrate in side view and arise from a more slender stem. The aedeagus in dorsal aspect is dilated in its basal half, the apical half slender and spiniform. Parameres stout, sinuous in dorsal aspect, slightly exceeding the aedeagus, upper surface towards tip granulose. Fused claspers forming a quadrate ventral plate, its apical margin very slightly excised, its upper surface densely spinose. On each side at its base is a small, quadrate lobe.

♀ Unknown.

Length of fore wing, ♂, 6.5 mm.

Holotype ♂ (pinned, abdomen in glycerine), Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961 (RLC), BMNH.

Paratypes (pinned), same data, 5 ♂ (RLC) ; Sangu, c. 5,200 ft., mixed plants by deep cliff in river gorge, 22.xi.1961, 1 ♂ (RLC), BMNH.

In male genital structure, and in having only two ocelli, this species is closely related to *Uenoa burmana* (Mosely). It is distinctly smaller, the outer lobe of tenth tergite is more quadrate in side view, the inner lobes are excised apically, the parameres are less dilated and slightly clavate apically in side view and the ventral plate is narrower and less excised apically. The male maxillary palpus is single-segmented. Comparative figures of the aedeagus and claspers of *burmana* and *hiberna* are given.

Family **LEPIDOSTOMATIDAE*****Dinarthrella betteni* Martynov**

Taplejung Distr., Sangu, c. 6,200 ft., mixed vegetation by stream in gully, ix-x.1961, 1 ♂ (RLC).

Previous distribution. E. HIMALAYAS (Darjeeling distr.).

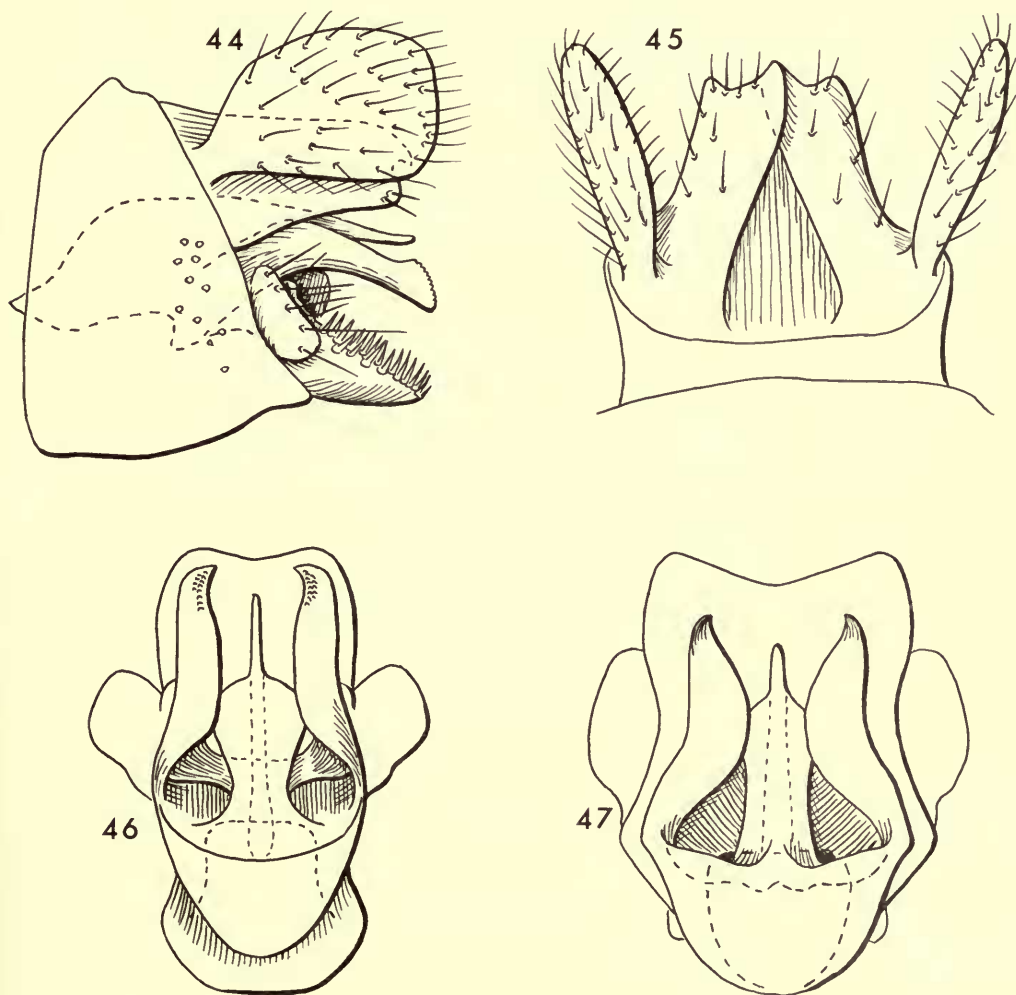
This specimen differs slightly from the figures given by Martynov. The basal segment of the antenna is relatively shorter and stouter and there are very slight differences in the tenth abdominal segment, but on such limited material these differences may be no more than individual variation.

Dinarthrum kamba Mosely, var.

Taplejung Distr., between Sangu and Tamrang, x-xi.1961, deep river gorge, c. 5,200 ft., 1 ♂ (RLC) ; river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961, 2 ♀ (RLC).

Previous distribution of *D. kamba* Mosely, N.E. BURMA.

The male genitalia are definitely of the pattern of *D. kamba*, but show slight differences and there are also slight variations in the basal segment of the antenna. In view of the considerable variation found by Schmid in his *D. iranicum*, these differences are considered only varietal. The two females are only provisionally associated with the male.



FIGS. 44-47. *Uenoa* spp. ♂ genitalia. 44-46, *U. hiberna* sp. n., 47, *U. burmana*. 44, lateral ; 45, dorsal ; 46, aedeagus and claspers, dorsal ; 47, the same.

Adinarthrum simplex sp. n.

(Text-figs. 48-51)

♂. General colour dark tawny. Basal segment of antenna about as long as distance between eyes, piceous, with a short, slender branch at base, directed upwards and inwards. Remaining segments tawny, annulated with fuscous. Legs tawny, spurs 2.4.4., one spur on anterior tibia very small. Wings rather denuded but with traces of fulvous pubescence and with whitish scale-like hairs persisting near the veins in both wings. In fore wing, anal fold about half as long as wing, not very conspicuous. Apical forks R_2 and R_4 definitely present and sessile. In the hind wing, apical fork R_2 is present and stalked, vein R_5 running into M_{1+2} and simulating a cross-vein, Cu_{1a} unforked.

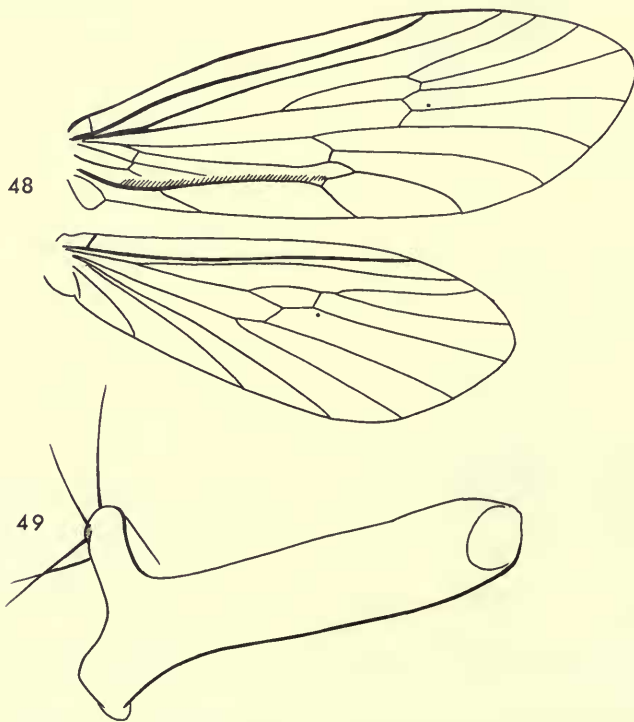
♂ GENITALIA. Tenth tergite forming a broad hood, somewhat triangular in side view, produced in a pair of triangular lobes at its centre in dorsal view. The apical margin on each side is serrate. Aedeagus slender, downcurved, parameres reduced to a pair of short, blunt processes over the base of the aedeagus. Claspers apparently single-segmented, with a short basal process, directed upward and rather stouter than is usual in the genus. In side view, the clasper is fairly slender, about twice as long as tenth tergite. From above, the clasper is rather broader, incurving and dilating to a truncate apex.

♀ Unknown.

Length of fore wing, ♂, 5.5 mm.

Holotype ♂ (mounted as microscope preparations), Taplejung Distr., river banks below Tamrang Bridge, c. 5,500 ft., x-xi.1961 (RLC), BMNH.

Paratype (pinned) data as above, 1 ♂.

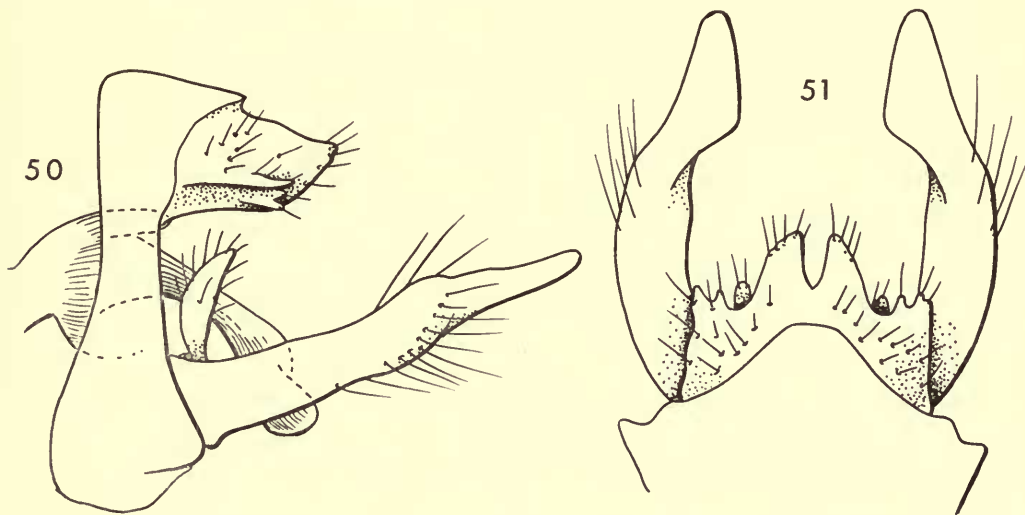


FIGS. 48-49. *Adinarthrum simplex*, sp. n. ♂. 48, wings; 49, basal segment of antenna.

This species has been placed in *Adinarthrum* on the general similarity of wings and genitalia, but it differs from the other species in the great reduction of the parameres, the stouter basal branch of the clasper and the apparently single-segmented clasper.

Lepidostomatidae ♀

Ulleri, 6-7,000 ft., 19.v.1954, 1 ♀ (JQ).



FIGS. 50-51. *Adinarthrum simplex* sp. n. ♂ Genitalia. 50, lateral ; 51, dorsal.

